



MSE-218SP User Manual

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EM Acoustics Loudspeakers

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DECLARATION OF CONFORMITY



The product contained within this manual conform to the requirements of the EMC Directive 89/336/EEC, amended by 92/31/EEC and 93/68/EEC, and to the requirements of the Low Voltage Directive 73/23/EEC amended by 93/68/EEC.

Products Covered:

MSE-218SP

EMC Emission	EN55103-1:1996 ¹
Immunity	EN55103-2:1996 ²
Electrical Safety	EN60065:2002

Notes:

- 1.This device may not cause harmful interference.
- 2.This device must accept any interference received, including interference that may cause undesired operation.

RECYCLING



This product and its packaging constitute the applicable product according to the WEEE directive. Please ensure that at the end of the working life of this product, it is disposed of sensibly in accordance with local and national recycling regulations. The packaging supplied with this product is recyclable. Please retain all packaging, however if disposing of this packaging please ensure that you comply with local recycling regulations. These products also all comply to the RoHS Directive 2002/95/EC.

IMPORTANT SAFETY INSTRUCTIONS

- Please read these instructions completely before use.
- Please keep the user manual in a safe place during the lifetime of the product - the user manual forms an integral part of the product.
- Heed all warnings.
- Follow all instructions.
- Do not use this product near water (for example, in damp rooms or near a swimming pool).
- Clean only with a dry cloth.
- Do not cover or obstruct the heatsink – install this product only in accordance with the instructions in this manual.
- Do not install near heat sources such as radiators, heat registers, stoves or other apparatus that produce heat.
- Protect the power cable from being walked on, pinched or damaged in any way. Pay particular attention to plugs and the point where they exit the loudspeaker.
- This product may only be used in accordance with the information provided within this manual. Before and during the usage of this product please ensure that all recommendations, especially those relating to electrical safety, are adhered to.
- The loudspeaker can only be disconnected from the power supply by removing the plug, which must remain freely accessible at all times.
- Unplug the loudspeaker from the mains power supply during electrical storms or when unused for long periods of time.
- Disconnect the mains plug before disconnecting the power cable from the loudspeaker.
- Refer all servicing to qualified personnel.
- Servicing is required when:
 - The power supply cable has been damaged
 - Liquid has been spilled into the loudspeaker
 - The loudspeaker has been exposed to rain or moisture
 - The loudspeaker has been dropped or suffered damage in any way
 - The loudspeaker exhibits a distinct change from its normal function or performance for undetermined reasons.

SERVICING

Do not attempt to service this product yourself. Opening or removing covers may expose you to dangerous voltages or other hazards – the amplifier module should only be opened by qualified personnel. Please refer any service issues to your local EM Acoustics representative. Upon completion of any service or repairs to this product, please ensure your dealer or distributor has performed safety checks to determine the loudspeaker is in proper operating condition.

ENVIRONMENTAL USE

Use this product only in E1, E2, E3 or E4 environments according to EN55103-2 "Electromagnetic compatibility – product family standard for audio, video, and audio-visual and entertainment lighting control apparatus – Part 2: Immunity".

VENTILATION AND HEAT SINK

The heatsink and cooling fans are provided to ensure reliable operation of the loudspeaker, and to protect it from overheating. The heatsink and fans must not be blocked or covered. This product should only be installed with adequate ventilation around the rear of the unit.

WATER AND MOISTURE

Do not use this product anywhere near water, or place any liquid-containing-vessels near to the unit where spillage could occur.

CLEANING

Clean the loudspeaker only with a dry cloth. Disconnect the loudspeaker from the mains before cleaning. Do not use liquid or aerosol cleaners.

POWER CABLE PROTECTION

Power supply cables should be routed so that they are not likely to be walked upon, pinched or damaged by items placed upon or against them. Pay particular attention to cables and plugs where they connect to the mains supply and to the loudspeaker itself.

LIGHTNING

For added protection of the product during lightning storms, or when it is left unattended and unused for long periods of time, disconnect it from the mains supply. This will prevent damage due to lightning and power line surges. Disconnection from the mains power supply can only be achieved by removing the plug from the mains socket and by external disconnection of all poles from the mains.

INTERFERENCE OF EXTERNAL OBJECTS AND/OR LIQUIDS

Never push any object of any kind into this product through its openings as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the loudspeaker.

ACCESSORIES

Only use accessories supplied by EM Acoustics specifically for use with this product. Unsuitable accessories for mounting or flying this loudspeaker could fail, causing serious physical injury and/or damage to the loudspeaker.

CONNECTIONS

When connecting this product, perform all connections **before** connecting the unit to the mains power. Failure to do so may cause electric shock and serious personal injury and/or damage to the loudspeaker.

MAINS POWER PRECAUTIONS

When mounting or connecting this product, always disconnect it from the mains supply. Only connect the product to an appropriate AC circuit and outlet, according to the requirements stated on the panel on the rear of the loudspeaker.

If a power cut occurs when the unit is switched on, it will restart automatically once the power supply is restored. All settings prior to the loss of power will be maintained.

IMPORTANT: Always connect the product to the mains using the blue PowerCON **MAINS IN** connector.

IMPORTANT: Only connect additional products to the white PowerCON **MAINS LINK** connector, keeping within the specified current rating.

IMPORTANT: When disconnecting this product from mains power, always disconnect the mains end first before disconnecting the PowerCON connector. Similarly, when connecting this product always connect to the loudspeaker first, before applying mains power at the supply.

ONLY CONNECT THIS PRODUCT TO MAINS POWER USING THREE CORE MAINS POWER CABLE WITH A SUITABLE GROUNDING CONNECTION. REMOVAL OF THE GROUNDING CONNECTION IS EXTREMELY DANGEROUS AND MAY VIOLATE LOCAL ELECTRICAL CODES OF CONDUCT.

1.0 - Introduction

Thank you for purchasing the MSE-218SP self-powered subwoofer from EM Acoustics. The MSE-218SP has been designed and rigorously tested to give you the utmost in sonic performance and many years of reliable, trouble-free operation. Please take the time to read this user manual thoroughly to ensure you get the best performance from your system and to ensure you set it up correctly and safely. If you have any questions or are in any doubt whatsoever about any aspect of your new system, please do not hesitate to contact us directly or your local EM Acoustics representative.

The MSE-218SP is one of the most accurate and powerful reflex subwoofers on the market today. The marriage of the utmost in drive unit technology with a state-of-the-art amplifier and control electronics package creates an ideal solution to a variety of applications. MSE-218SP loudspeakers can be deployed in a wide range of professional audio applications and will deliver stunning results time after time. Added to this is the one-to-one customer support that EM Acoustics is known for and you should be congratulated for purchasing one of the finest loudspeaker products on the market today.

This manual contains all the information you should need on topics of set up, connection, flying & stacking and basic service. If you feel we have missed anything, or you have a question not covered by this manual, please visit our website www.emacoustics.co.uk and send us a message or give us a call – we're only too happy to help.

Unpacking

Please take care when unpacking your loudspeaker system. Once unpacked, please inspect each enclosure thoroughly for any transit damage and in the case of any damage please notify your carrier immediately. It is the responsibility of you, the consignee, to instigate any claim. Please retain all original packaging in case of future re-shipment.

System Setup

Professional loudspeaker systems are potentially dangerous objects if used incorrectly. Please ensure that you read this section fully, and contact EM Acoustics or your local dealer should you be in any doubt over correct operation procedures.

Professional loudspeaker systems are capable of producing damage-inducing sound pressure levels, and hence care should be taken when setting your system up, particularly when it comes to loudspeaker placement within a venue. Damage to the ear can result from levels above 90dB under prolonged exposure.

2.0 – The MSE-218SP Subwoofer

The MSE-218SP is the self-powered variant of the MSE-218 loudspeaker, and as such follows all the same principles in design and operation. The MSE-218SP is designed to be a reliable, rugged subwoofer that will stand up to the rigours of use both in fixed installations and touring applications.

The reflex design utilizes a pair of powerful 4.5" voice coil 18" (457mm) neodymium LF drive units in an incredibly rigid and rugged enclosure. Various features have been incorporated to assist in use on the road – ergonomically-placed handles, touring skids and stacking recesses, tour-grade castors and M20 threaded flange adapters for mounting fullrange products along with the subwoofer.

The MSE-218SP subwoofer is designed and manufactured in our UK headquarters, and every unit is rigorously tested before they leave the factory.

3.0 – Mains Power Requirements

3.1 - Power Supply

The MSE-218SP utilises a pair of UMAC™ Class-D amplifier modules with a Power Factor Correction (PFC) power supply, ensuring universal mains voltage operation. The amplifier modules can safely operate with voltage ranges from 100-120VAC and 200-240VAC.

Important Note – please be aware that using these products on 100-120VAC will draw more current from the mains supply than using at 200-240VAC.

3.2 - AC Input Connector (BLUE)

The blue Neutrik PowerCON connector supplies mains power to the MSE-218SP. This connector is rated at 20 amps and is locking to prevent accidental disconnection. Any additional loudspeakers connected to the MAINS LINK (GREY) connector also take their power from this primary input connector, and as such you must ensure the total load does not exceed 20 amps.

3.3 - AC Link Connector (GREY)

The grey Neutrik PowerCON connector supplies mains power to additional loudspeakers in the chain. The PowerCON connector is a locking design, which prevents accidental disconnection. Cables used to connect additional loudspeakers should be of a suitable gauge to support the potential current draw from multiple loudspeakers.

3.4 - Maximum Number of Looped Mains Connections

It is very important that the total current draw does not exceed 20 amps. Please remember that any loudspeaker connected in the chain will draw its power from the blue mains input connector on the first loudspeaker in the chain. Detailed below are the maximum recommended numbers of MSE-218SP subwoofers that can be connected at different voltage and supply current limits.

20-amp supply limit:

Product	115VAC	230VAC
MSE-218SP	1 looped (2 total)	3 looped (4 total)

16-amp supply limit:

Product	115VAC	230VAC
MSE-218SP	no looping	2 looped (3 total)

3.5 - Powering up the MSE-218SP

When mains power is supplied, the power supply automatically detects the supply voltage and adjusts itself accordingly. Once the display has gone through the “initializing” stage, the screen will show the unit name and current preset recalled, and is then ready for use.

Important Note: When connecting the MSE-218SP to mains power supplies, always connect the PowerCON first, and then connect to the mains supply. Similarly when disconnecting, always disconnect from the mains supply first. Failure to do this can cause arcs within the PowerCON connector, which can cause the amplifier to detect a fault and require resetting.

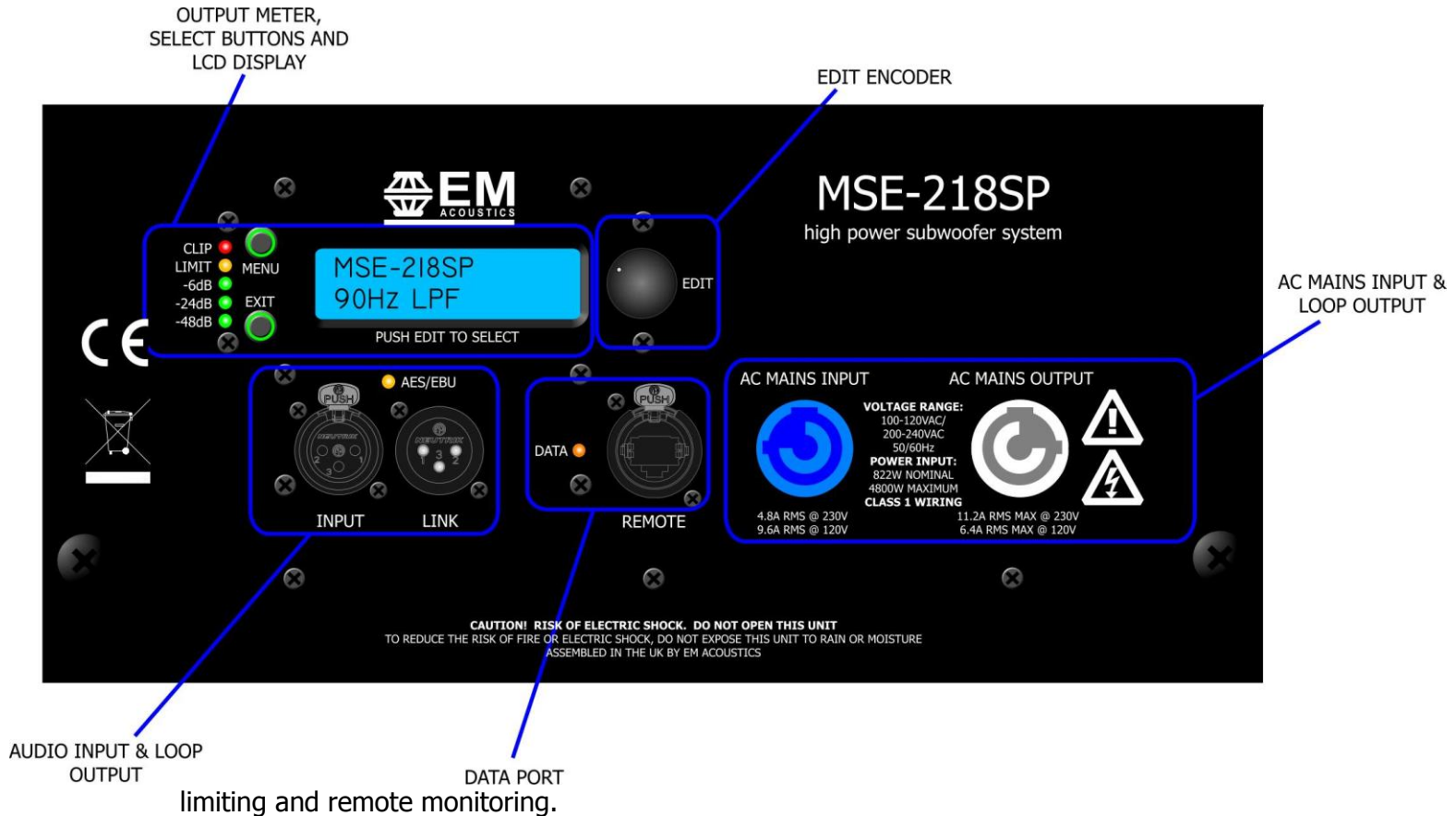
Electrical Safety Issues

Please pay close attention to the following electrical and safety issues:

- a) The MSE-218SP requires a grounded mains outlet. Always use a grounded outlet and plug.
- b) Never use a ground-lifting adapter or cut the earth pin or cable.
- c) Do not exceed the 20-amp current capability of the PowerCON input connector. When connecting multiple loudspeakers together, consider the current requirements of **all** loudspeakers in the circuit – including the first one.
- d) Ensure that the AC power connector for the mains outlet has the appropriate rating for the planned total current draw, and is also suitable for the area the loudspeaker is being used in.
- e) Do not use the loudspeaker if the power cables are frayed or broken.
- f) Keep all liquids away from the units to avoid hazards from electrical shock.

4.0 – Amplification and Audio

The MSE-218SP includes a highly advanced 64-bit DSP processing card to handle high & low pass filters, gain and delay settings, which are accessed by means of preset programs that are factory installed into the unit. This DSP card feeds a pair of Class-D amplifier modules (one module per drive unit) providing ample power to drive your loudspeakers to their full potential. The amplifier and DSP combination also provides full



4.1 - Audio Inputs

The loudspeakers are supplied with female XLR input connectors, and male XLR link output connectors. Both of these connectors are wired pin 1 screen, pin 2 positive, pin 3 negative. The MSE-218SP loudspeakers can accept both analog and digital AES/EBU inputs. The factory default setting is analog – see later in this manual for details on selecting digital input.

4.2 - Linking multiple loudspeaker audio signals

Via the male output XLR, multiple loudspeakers can be linked together on the same signal. With the digital input stage selected, the output is internally buffered so in essence an infinite number of units can be connected in parallel without signal degradation. In analogue mode, ensure that the source device can drive the combined impedance of all of the connected loudspeakers. With most sources, 6 loudspeakers in a chain is a practical maximum limit.

4.3 - DSP System Menu Structure

The advanced DSP card within the amplifier modules handles all crossover, gain and limiting functions for the MSE-218SP. The user interface is via a backlit LCD screen on the rear of the unit, which provides a very intuitive means of accessing relevant information as well as recalling presets for different system configurations.

4.3.1 – LCD Display and Output Meter

The LCD display is the primary means of establishing information from the loudspeaker. By default, the screen will display the unit name on the top line and the currently selected program on the bottom line. Adjusting parameters via the MENU key or EDIT encoder will change the display to reflect the current function.

The output signal meter displays the level relative to limit and clipping of the amplifier channel which is *working the hardest*. Should the meter be displaying the red CLIP LED, reduce the system level in order to prevent damage.

4.3.2 - MENU Key

Each press of the menu key will step through the following options:

LOAD PRESET=>SAVE PRESET=>ACCESS LEVEL=>VERSION INFO

On each of these options, turning the "Edit" rotary encoder gives the user the relevant choices:

LOAD PRESET – turn the Edit encoder to select the desired preset to recall. Press the Edit control to select preset, and then highlight Yes/No and press the encoder again to recall.

SAVE PRESET – turn the Edit encoder to select an unused preset location, then press the Edit encoder to select. Preset name is then requested, which can be entered by rotating the edit encoder for each character, and pressing the encoder to move to the next character. Once you have finished, press the MENU key and you are asked to confirm preset storing by selecting YES with the Edit encoder and pressing the Edit control. "PRESET SAVED OK" will then be displayed.

ACCESS LEVEL – Administrators can choose to lock all functions on the amplifier modules by entering the relevant password – please contact EM Acoustics for further details on this function.

VERSION INFO – by pressing the Edit encoder repeatedly, the unit will step through user information such as software version, hardware version, IP address and MAC address.

4.3.3 – EXIT Key

The exit key takes you one step back in the menu system from wherever you are for each press of the key. For example, if you have just adjusted the input gain, pressing the exit key will take you back to the parameter scroll screen.

4.3.4 - EDIT encoder function

The Edit encoder is the primary control for the user when operating the MSE-218SP. From the opening display screen (which displays the unit name – which by default is “MSE-218SP” but can be changed by the user in the remote software – on the top line and the loaded preset on the bottom line), simply rotating the encoder will display the unit status in the following order:

INPUT GAIN=>INPUT DELAY=>INPUT SOURCE

Pressing the edit encoder will then allow the user to edit the selected function:

INPUT GAIN – adjustable by the user from 0dB down to -20dB. This control adjusts both analog and digital input gains simultaneously.

INPUT DELAY – adjustable by the user from 0.0ms to 1000ms.

INPUT SOURCE – this selects either standard analog input, or AES/EBU digital input. If digital is selected, the yellow “AES/EBU” LED will illuminate between the two XLR connectors. There are four options – Analog, AES/EBU Left channel, AES/EBU Right channel and AES/EBU mono sum.

4.4 – Remote Monitoring and Control

By connecting a cat5 Ethernet cable to the RJ45 port on the rear of the unit, remote monitoring and control can be achieved through the optional remote software. Please see the remote software manual for more details. The amber “Data” LED will illuminate showing an active data connection.

5.0 – MSE-218 subwoofers in use

5.1 - System Overview

MSE-218SP subwoofers can be used either in landscape or portrait format, depending on space requirements. Landscape format is recommended as the touring skids on the underneath will protect the cabinet finish, and the stacking recesses can be used to add extra stability when stacking multiple units.

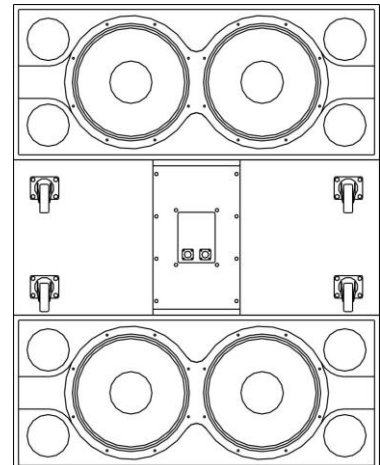
5.2 – Stacking MSE-218SP Enclosures

The touring skids and stacking recesses (on the bottom and top of the enclosure respectively) are intended to add extra stability to MSE-218SP stacks. Wherever possible, the enclosures should be used in landscape format to use these skids and recesses, as the skids will protect the paint finish. The placement of the skids allows the subwoofers to be stacked with drive units facing either forwards or backwards to enable cardioid array creation.

5.3 – Creating Cardioid Arrays

By assembling a stack of three MSE-218SP subwoofers, with the central unit facing backwards, a cardioid subwoofer array can be created which offers significant low frequency rejection to the rear and sides of the array. When using the MSE-218 in this way, the two front-firing subwoofers should be set into the “normal” preset, and the rear-firing unit should be set into the “cardioid” preset.

When using cardioid arrays, ensure at least 1 metre clearance is left behind the array between the subwoofers and any walls or other hard surfaces.



5.4 – Mounting fullrange products above the MSE-218SP

IMPORTANT SAFETY CONSIDERATIONS

Please pay careful attention when creating stacks of MSE-218SP subwoofers or mounting fullrange products – either as stacks or using the M20 flange adapters. Ensure that the instructions in this manual are followed correctly – MSE-218SP loudspeakers are heavy and incorrect use could result in injury. Ensure that the floor where the system is going to be placed is strong enough to withstand the total system weight placed upon it.

When assembling stacks of subwoofers, the use of ratchet straps to secure both the subwoofers and any fullrange loudspeakers stacked above is strongly recommended to reduce the risk of loudspeakers being shaken off the subwoofer and falling.

To use the M20 threaded flange adapters, use a telescopic distance pole such as the EM Acoustics DP-01. Screw the threaded end into the flange adapter, making sure it is screwed in completely. Then, carefully lift the fullrange loudspeaker onto the pole.

6.0 - Servicing Information

Your EM Acoustics loudspeakers have been rigorously tested before they leave our factory, to ensure that they give you a lifetime of flawless operation. Should any of your drive units fail and need replacing, please follow the guidelines below.

MSE-218: Low Frequency Drive Unit

1. Using a PZ2 Pozidrive screwdriver, undo the screws securing the front grille in place. Gently remove the grille from the front of the enclosure.
2. Using a 5mm Allen key, remove the eight M6 socket-head bolts holding the required drive unit in place. Gently lift the drive unit out of its locating hole – please take care as it is heavy! Carefully disconnect the cables from the drive unit.
3. To reinstate the driver, simply reverse the above procedure. Please observe the correct polarity – red cable to positive terminal, black cable to negative.
4. Reinstall the grille by gently placing it in place over the front of the loudspeaker. Replace the PZ2 screws to secure the grille in place.

Appendix A – Technical Specifications

MSE-218 self-powered subwoofer

ACOUSTICAL

ENCLOSURE TYPE:	dual drive unit bass reflex, self-powered
FREQUENCY RESPONSE ¹ :	65Hz – 20KHz +/- 3dB
DISPERSION ² :	omnidirectional (unless in Cardioid mode)
DRIVE UNITS:	2 x 18" (457mm) neodymium LF cone drive unit
MAXIMUM SPL ³ :	137dB continuous, 143dB peak

MECHANICAL

DIMENSIONS (HxWxD):	550 (21.7) x 1300 (51.2) x 850 (33.5) mm/(ins)
NET/SHIPPING WEIGHT:	118 (259.6) / 122 (268.4) kg/(lbs)
ENCLOSURE:	18mm (3/4") multi-laminate Birch plywood – rebated, screwed & glued. Finished in black semi-matt textured paint
RIGGING/SUSPENSION:	2 x M20 threaded flange adapters 8 x tour-grade bar handles 4 x tour-grade castors
GRILLE:	Fabric-backed hex punched steel

AMPLIFIER PACKAGE

AMPLIFIER TYPE:	Dual monobloc Class-D
AMPLIFIER POWER:	2 x 2400W RMS @ 4 ohm load
DSP SYSTEM:	96kHz sample rate, 120dB dynamic range
COOLING:	2 x low-speed 5VDC fan on heatsink – temperature controlled, only required under extreme conditions
CONNECTORS:	Female XLR input, male XLR link output (selectable as analog or AES/EBU input) Neutrik PowerCon™ input with loop output Neutrik Ethercon™ RJ45 socket

DISPLAY:	High resolution backlit LCD display with rotary encoder for user control
OPERATING VOLTAGE:	Automatic selection via PFC power supply: 100-120V AC & 200-240V AC, 50/60Hz
NOMINAL CURRENT:	4.8A RMS @ 230V 9.6A RMS @ 120V
POWER CONSUMPTION:	822W nominal 4800W maximum

Notes on measurement conditions:

¹Measured on-axis at 2m in an anechoic environment and referenced to 1m.

²Nominal dispersion, measured in an anechoic environment and averaged over stated bandwidth

³Calculated and verified by subjective listening test of familiar program material.

Appendix B – Accessories & Spare Parts List

01A022	DU-1802	18" neodymium LF drive unit, 4 ohms
01C019	RK-1802	4 ohm recone kit for DU-1802
04A024	RG-218	Replacement steel grille
10E217	TC-218	Padded transit cover for MSE-218

Appendix C – Warranty Information

Limited Warranty

This EM Acoustics loudspeaker product is warranted to the original end-user purchaser and all subsequent owners for a period of **three years** from the original date of purchase.

Warranty Coverage

This warranty covers defects in materials and workmanship. It does not include:

- Damage or failure caused by accident, misuse, neglect, abuse or modification by any person other than an authorised EM Acoustics representative.
- Damage or failure caused by operating the loudspeaker product contrary to the instructions contained within this manual.
- Damage caused during shipment.
- Claims based on any misrepresentation by the seller.
- Products which contain anything other than the original components (or EM Acoustics factory supplied spare parts).
- Products on which the serial number has been removed, altered or defaced.

Returning your EM Acoustics loudspeaker

Should your EM Acoustics loudspeaker develop a fault, please return it (freight prepaid) in its original packaging, along with proof of purchase to your local dealer or to:

EM Acoustics (Returns Department), Building 74, Dunsfold Park, Cranleigh, Surrey, GU6 8TB, UK

including a description of the suspected fault. Serial numbers must be quoted in all correspondence relating to the claim. EM Acoustics or its representatives are in no way liable for any loss or damage in transit, and hence it is recommended that the sender insure the shipment. EM Acoustics will pay for return freight should the repair be covered under warranty.

EM Acoustics' liability is to the replacement or repair (at our discretion) of any defective components, and as such are not liable for any incidental and consequential damages including (without limitation) injury to persons, damage to property or loss of use.

This warranty is exclusive and no other warranty is expressed or implied. This warranty is also in addition to – and in no way detracts from – your statutory rights as a consumer.